

**Bachelor of Engineering**  
**Third Semester Main Examination, Dec-2020**  
**Digital Circuits & System [EC221]**  
**Branch-EC**

**Time: 3:00 Hrs**

**Max Marks 70**

**Note : Attempt any five questions. All questions carry equal marks.**

- Q.1 (a) Write down AND gate, NAND gate and exclusive-OR gate with suitable diagram and truth table?  
(b) Explain De-Morgan's theorem with example?
- Q.2 (a) Simplify the logic function using K-map  
(b)  $F(A, B, C) = A'C + A'B + AB'C + BC$
- Q.3 (a) Express the Boolean function  $F = A + B'C$  as a standard sum of minterms?  
(b) Explain full adder with truth table?
- Q.4 (a) Write down half adder subtractor with truth table?  
(b) Explain multiplexer with suitable diagram?
- Q.5 (a) What is a decoder and explain how 3\*8 decoder is constructed?  
(b) Explain SR flip-flop and JK flip-flop?
- Q.6 (a) Write down the master-slave flip-flop?  
(b) What is difference between level triggering and edge triggered?
- Q.7 (a) Write down the edge triggered?  
(b) Write down the Asynchronous counter?
- Q.8 (a) Write short note on:  
(a) PROM (b) EPROM (c) static RAM?

**Bachelor of Engineering**  
**Third Semester Main Examination, Dec-2020**  
**Network Analysis [EC222T]**  
**Branch - EC**

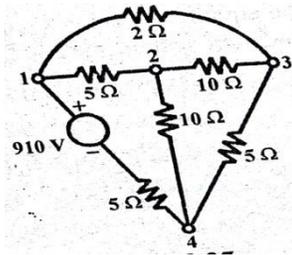
**Time: 3:00 Hrs**

**Max Marks 70**

- Note :**
1. Attempt any five questions out of eight.
  2. Answer should be precise & to the point only.
  3. Assume suitable data is required.

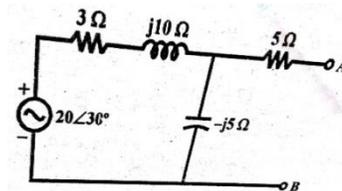
Q.1 (a) Explain the terms tie-set matrix and cut-set matrix of a network with examples.

(b) Calculate the branch voltages and branch currents for the network show in figure using network graph theory.



Q.2 (a) State and explain superposition theorem and also write its limitations.

(b) Find the thevenins equivalent circuit at terminals AB for the network shown in figure.



Q.3 (a) Explain the sinusoidal response analysis of parallel RLC network.

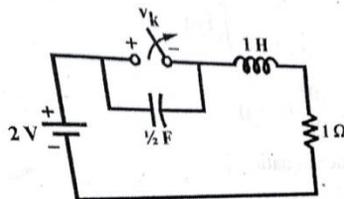
(b) Discuss initial conditions in different network elements? Define time constant for R-L networks.

Q.4 (a) Write short note on Milliman's theorem?

(b) State minimum power transfer theorem for all the various kinds of network and loads?

Q.5 (a) Write short note on initial and final value theorem?

(b) The network shown in figure is in steady state with the switch K closed. At  $t = 0$  the switch is opened. Determine the voltage across the switch  $V_k$  and  $\frac{dV_k}{dt}$  at  $t = 0^+$



Q.6 (a) Define Y-parameters for a two-port network?

(b) Write a short note on interconnection of two-ports?

- Q.7 (a) Explain the transient in R-L circuit?  
(b) State and Explain Nortons theorem?
- Q.8 (a) Write a short note on following parameters?  
(i) Hybrid parameters (ii) Inverse parameters  
(b) State and explain Norton's Theorem.

Enrollment No.....

**Bachelor of Engineering**  
**Third Semester Main Examination, Dec-2020**  
**Electronic Devices & Circuits [EC223]**  
**Branch- EC**

**Time: 3:00 Hrs**

**Max Marks 70**

**Note : Attempt any five questions. All question carry equal marks.**

- Q.1 (a) Write the V-I plot of semiconductor diode and explain its working principal.  
(b) Write down working and application of PIN diode.
- Q.2 (a) Explain the basic structure of LED.  
(b) Draw the complete input and output characteristics of CE amplifier and explain them.
- Q.3 (a) Write short note on: (i) AC load line (ii) DC load line  
(b) Explain transistor as switch work.
- Q.4 (a) Explain the working of enhancement model in a MOSFET with circuit symbol and characteristics.  
(b) Draw the FET characteristics and explain the various operating regions of FET. Also, draw its transfer characteristics.
- Q.5 (a) Write short note on “h”- parameters.  
(b) Explain cascading amplifier with suitable diagram.
- Q.6 (a) Write short note on class-A, class-B amplifier with suitable diagram.  
(b) Explain push-pull amplifier.
- Q.7 (a) Explain JFET with suitable diagram.  
(b) Draw and discuss the characteristics of P-channel depletion type MOSFET.

- Q.8 (a) Write down DIAC and TRIAC characteristics.  
(b) Explain thyristors parameter and its application.

Enrollment No.....

**Bachelor of Engineering**  
**Third Semester Main Examination, Dec-2020**  
**Measurements and Instrumentation [EC224]**  
**Branch-EC**

**Time: 3:00 Hrs**

**Max Marks 70**

**Note : Attempt any five questions. All questions carry equal marks.**

- Q.1 (a) Explain DC ammeter and AC ammeter.  
(b) Explain multi-meter, Power meter and Bolometer.
- Q.2 (a) Explain different parts of CRO with suitable diagram.  
(b) Describe AC voltmeter using rectifier.
- Q.3 (a) Explain digital voltmeters and multi-meters.  
(b) Write down advantages of digital instrument over analog instrument.
- Q.4 (a) Explain analog to digital conversion.  
(b) Explain digital to analog conversion.
- Q.5 (a) Explain sweep frequency generator and square wave generator.  
(b) What is Beat frequency oscillator.
- Q.6 (a) Write down the liquid crystal display and difference between LED TV and LCD TV.  
(b) Explain the basic structure of LED.
- Q.7 (a) Write down the RVDT and RTD.  
(b) Explain thermistor and thermocouple.
- Q.8 (a) Write down the photo-diode and photo transistor.  
(b) What is LVDT? Explain it.

Enrollment No.....

**Bachelor of Engineering**  
**Third Semester Main Examination, Dec-2020**  
**Communication Skills [HU220]**  
**Branch-CE/EX/EC/CSE/IT/ME**

**Time: 3:00 Hrs**

**Max Marks 70**

**Note : Attempt any five questions. All questions carry equal marks.**

- Q.1 What do you mean by Communication? Describe it.
- Q.2 Explain process of communication with diagram.
- Q.3 What are upward and downward communication?
- Q.4 Differentiate one way and two way communication.
- Q.5 List out challenges in communication.
- Q.6 Explain barriers to communication.
- Q.7 Write a short note on Articles.
- Q.8 What are parts of speech? Explain with suitable examples.

Enrollment No.....

**Bachelor of Engineering**  
**Third Semester Main Examination, Dec-2020**  
**Mathematics-III [MA-220]**  
**Branch-EE/EC/CS/IT**

**Time: 3:00 Hrs**

**Max Marks 70**

**Note : Attempt any five questions.**

**All question carry equal marks.**

- Q.1 (a) State and prove Cauchy's theorem.  
(b) Show that the function  $e^x(\cos y + i \sin y)$  is analytic and find its derivative.
- Q.2 (a) Using Cauchy's integral formula prove that :  $\int_C \frac{e^{2z}}{(z+1)^4} dz = \frac{8\pi e^{-2}}{3} i$ , where C is the circle  $|z| = 3$ .  
(b) Find the imaginary part of the analytic function whose real part is  $x^3 - 3xy^2 + 3x^2 - 3y^2$ .
- Q.3 (a) Find the real root of the equations  $x^3 - 9x + 1 = 0$  by the method of false position.  
(b) Apply Newton Raphson method to solve  $3x = \cos x + 1$ .
- Q.4 (a) Using Newton's forward Interpolation formula, find the value of  $f(1.6)$ , if  
x: 1 1.4 1.8 2.2  
y: 3.49 4.82 5.96 6.5  
(b) Solve the following system by Gauss elimination method  
$$6x_1 + 3x_2 + 2x_3 = 6$$
$$6x_1 + 4x_2 + 3x_3 = 0$$
$$20x_1 + 15x_2 + 12x_3 = 0$$

Q.5 (a) Apply Lagrange's formula to find the value of x when  $f(x) = 0$  given that

$$\begin{array}{cccc} x: & 30 & 34 & 38 & 42 \\ f(x): & -30 & -13 & 3 & 18 \end{array}$$

(b) Solve initial value problem  $\frac{dy}{dx} = 1 + xy^2$ ,  $y(0)=1$  for  $x = 0.4, 0.5$  by using Milne's method when it is given that

$$\begin{array}{ccc} x: & 0.1 & 0.2 & 0.3 \\ y: & 1.105 & 1.223 & 1.355 \end{array}$$

Q.6 (a) Solve the equation  $\frac{dy}{dx} = x + y$  with initial condition  $y(0) = 1$  by Runge kutta rule from  $x = 0$  to  $x = 0.4$  with  $h = 0.1$

(b) Evaluate  $\int_{0.5}^{0.7} x^{1/2} e^{-x} dx$  approximately by using a suitable formula.

Q.7 (a) Solve the following by Euler's modified method, the equation  $\frac{dy}{dx} + \log(x + y)$ ,  $y(0) = 2$  at  $x = 1.2$  and  $1.4$  with  $h = 0.2$

(b) Use picard's method to approximate y when  $x = 0.2$  given that  $y = 1$  when  $x = 0$  and  $\frac{dy}{dx} = x - y$

Q.8 (a) Find the z Transform of Sinak, k7,0

(b) Solve the following by Gauss Seidel iteration Method

$$10x + y + z = 12$$

$$2x + 10y + z = 13$$

$$2x + 2y + 10z = 14$$